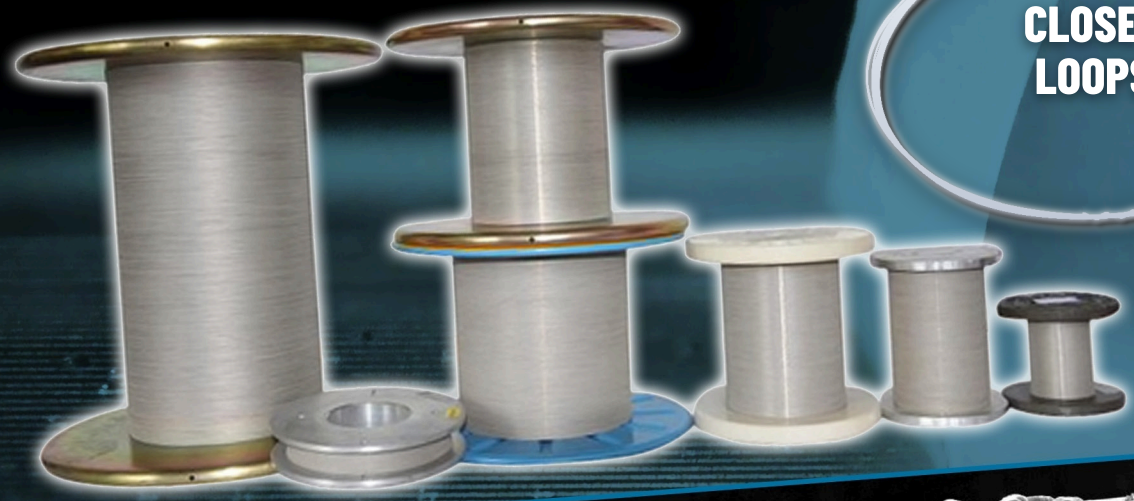
AMERICAN MANUFACTURER • ESTABLISHED 1990 • CUSTOM MANUFACTURING • EXPERT TECHNICAL SUPPORT

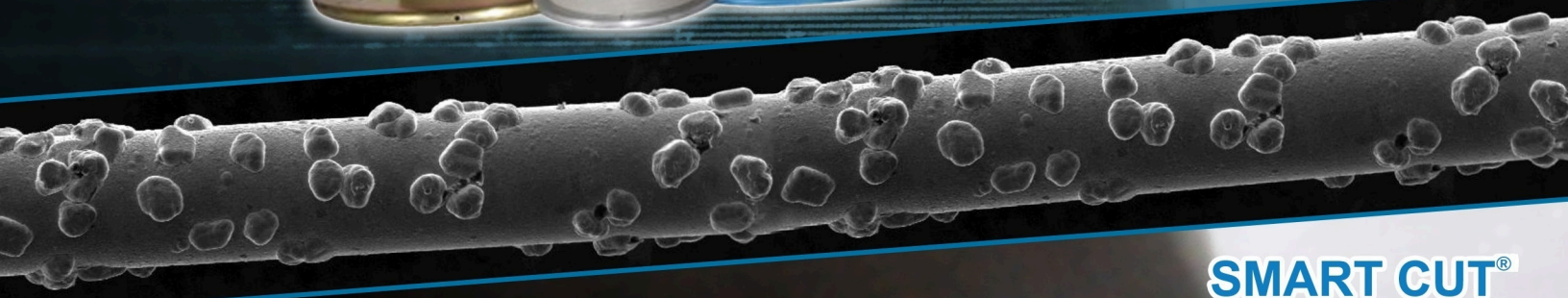
DIAMOND WIRE

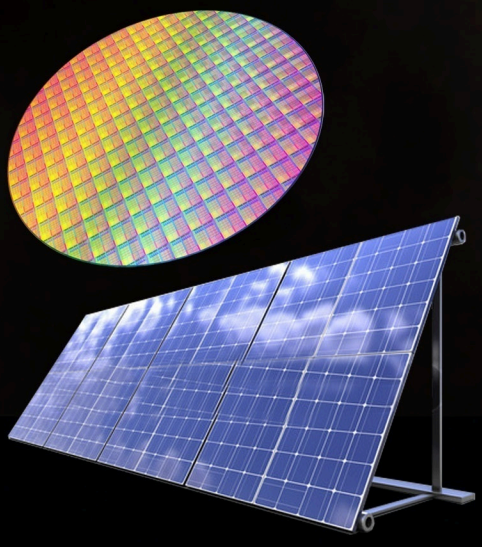
Spools & Closed Loops • Electroplated Nickel Bond
0.12 mm to 0.42 mm • Custom Wire For Any Wire Saw

SLICING SILICON, SAPPHIRE & CRYSTALS



CLOSED LOOPS





Different Product
Different Technology
Different Company

Expect MORE from your tools.

SMART CUT®

REQUEST A QUOTE ›

SMART CUT®
UKAM Industrial Superhard Tools
25205 Avenue Tibbitts Valencia, CA 91355 Tel: 661-257-2288
Fax: 661-257-3833 www.ukam.com lel@ukam.com

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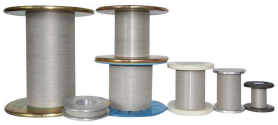
Everything you need to select, specify and order ***SMART CUT***® diamond wire — click any title or picture to jump to that page



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QUICK START

SPECIFY YOUR SPOOL P. 09 ›
APPLICATION DATA SHEET P. 27 ›
REQUEST A QUOTE ›

Standard or custom wire, made to your specification — with expert technical support from an American manufacturer since 1990.

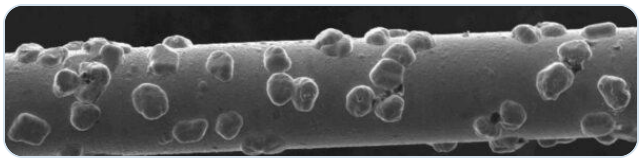
SMART CUT® DIAMOND WIRE

Advanced minimum kerf loss, minimum material deformation cutting solution

SMART CUT® Diamond wire produces minimum kerf loss, less sub-surface damage, and contamination free coolant. It is used for precision cutting of artificial crystals, ceramics, quartz glass, monocrystalline and polycrystalline silicon, sapphire, and specialty metals. The design provides high dimensional accuracy and smooth surfaces, often eliminating the need for extensive secondary processing.

Diamond wire cutting is also an environmentally responsible process, as it eliminates slurry recycling and disposal issues common in older abrasive methods. This makes it the preferred choice for laboratories and production environments that require consistent quality, process stability, and compliance with modern environmental standards.





Diamond wire on spools of every size • diamond-coated wire, SEM view

3–5×	0.12–0.42	< 20 °C	100s
cutting rate of abrasive slurry	mm standard wire Ø — very low kerf loss	temperature rise in the cut (slurry: 40–60 °C)	of wafers sliced simultaneously

Typical values compared with abrasive slurry wire sawing — actual results depend on material, machine and process parameters.

INDUSTRIES

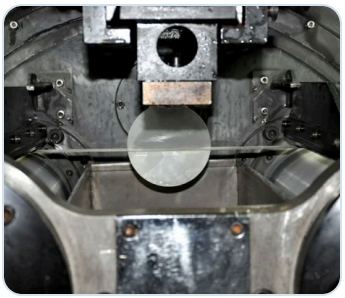
- PV / solar
- LED
- Semiconductor
- Optics & photonics
- Crystal growth
- Advanced materials

APPLICATIONS

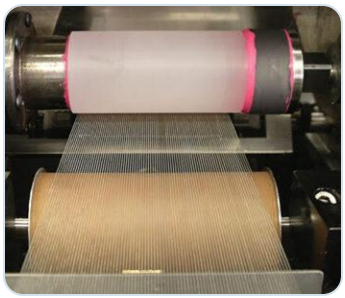
- Squaring
- Cropping
- Dicing
- Wafering / slicing
- Bricking
- Filament cutting

MATERIALS USED ON

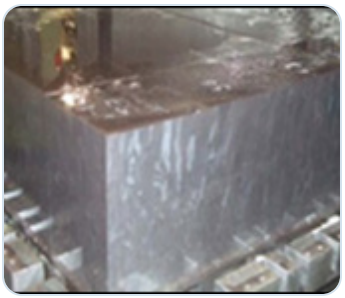
- Sapphire
- Glass
- CaF_2
- W alloy
- Silicon
- GaAs
- Crystal
- Ceramics
- SiC
- Ge
- Quartz
- Magnetic materials
- Other hard brittle materials



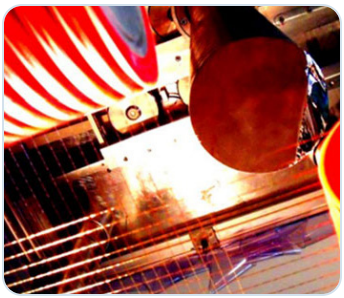
Sapphire Wafering



Multi-Wire Slicing



Silicon Bricking & Cropping



Silicon Filaments

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

FEATURES & ADVANTAGES

Why production lines and laboratories choose ***SMART CUT***® Diamond Wire

01 ULTRA-PRECISE KERF CONTROL

Experience minimal kerf loss with ***SMART CUT***®, delivering precise material cuts and significantly reducing waste.

02 REDUCED SUB-SURFACE DAMAGE

Our diamond wire is engineered to cut delicately, preserving the integrity of the material's surface for high-quality post-process results.

03 CLEAN CUTTING OPERATION

Designed to be used with contamination-free coolants, ensuring that your material remains pure and unblemished.

04 BROAD MATERIAL COMPATIBILITY

From monocrystalline silicon to exotic metal materials, ***SMART CUT***® is versatile enough to handle a diverse range of cutting challenges.

05 ENVIRONMENTALLY FRIENDLY PROCESS

Eliminate the need for slurry disposal with a diamond wire sawing process that's cleaner for your workspace and the planet.

06 OPTIMAL MATERIAL PRESERVATION

Superior cutting action translates to less material deformation, chipping, and loss, conserving your valuable resources.

07 PREFERRED BY EXPERTS

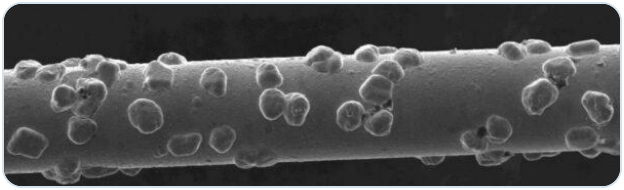
A trusted tool amongst professionals in solar energy, advanced materials manufacturing, and crystal growth industries.

08 CUSTOM MANUFACTURING

Wire diameter, core material, diamond grit size, bond type and spool or loop length can be specified to match your machine and material.



Diamond wire web on a multi-wire saw — hundreds of slices in one pass



Diamond particles on the wire, SEM view

ADVANTAGES

PRODUCTIVITY

- High cutting feed & capacity
- Increase cutting speed & productivity — 3 to 5 times cutting rate of abrasive slurry
- Excellent cutting accuracy
- High level of consistency & process stability

LOWER COST

- Improve return on investment — less initial capital required
- Reduce costs from reduced TCO, less utility costs, & reduced secondary operations
- Lower cost of ownership than comparable slurry-based systems
- Possibility of silicon kerf recycling

QUALITY & ENVIRONMENT

- Very low kerf loss — standard wire diameters from 0.12 mm to 0.42 mm
- Improve TTV (total thickness variation)
- Environment friendly — no need for slurry recycling and disposal
- Can be implemented in almost any environment to replace slurry wire saws

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SELECTING THE RIGHT DIAMOND WIRE

Wire diameter, diamond grit and core material are matched to your material and machine

FINE WIRE

75–180 µm

diamond grit 10–30 µm

Semiconductor wafers, sapphire, optics

MEDIUM WIRE

240–340 µm

diamond grit 30–40 µm

Solar wafers, glass, ceramics

LARGE WIRE

340–420 µm

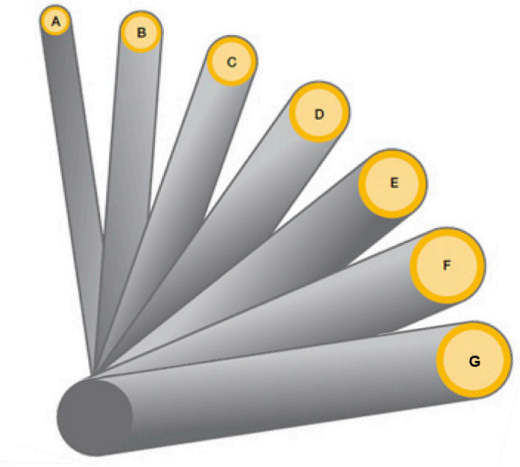
diamond grit 40–50 µm

Stone, composites, silicon ingots

Typical examples by size class — any wire diameter from 50 to 520 µm can be made to order, including sizes between these classes (see page 06).

DIAMOND WIRE CORE MATERIALS

Core Material	Characteristics & Typical Use
High-Tensile Steel	Strong, cost-effective, widely used
Stainless Steel	Corrosion-resistant, good for wet environments
Tungsten	High strength, heat resistant, used for ceramics and sapphire
Molybdenum	Strong, corrosion-resistant, stable for fine wires
Specialty Alloys (NiTi, composites)	Ultra-flexible, fatigue-resistant, used in advanced semiconductor cutting



Standard wire diameters A through G (see specifications, page 06)

WHAT TO SPECIFY WHEN ORDERING

Wire Diameter
Overall diameter incl. abrasive layer

Core Material
Steel, stainless, tungsten, molybdenum, NiTi

Diamond Grit
5–50 µm depending on finish & speed

Bond Type
Electroplated nickel, resin or multi-layer (loops: electroplated only)

Format
Spool (bobbin) or closed loop

Length
Spool length or loop length

Machine
Wire saw make, model & pulley sizes

Material
Workpiece material, size & wafer thickness

Not sure which wire fits your process? Complete the Application Data Sheet on page 27 and a UKAM applications engineer will recommend the optimal specification.

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

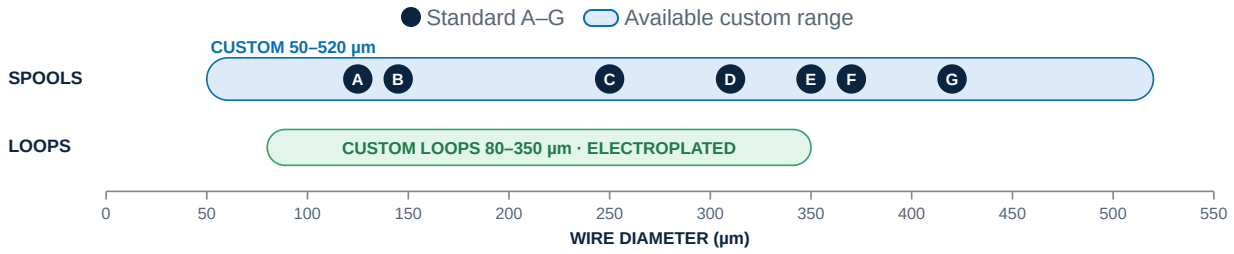
DIAMOND WIRE SPECIFICATIONS

Seven standard specifications — or custom wire made to your exact specification

STANDARD SPECIFICATIONS — electroplated diamond wire on high-tensile steel core

	Item No.	Wire Ø (mm)	Core Ø (mm)	Tol. ±mm	Break Tension (N)	Diamond Size	Winding Tension (N)	Pitch (mm)	Conc. (pcs/mm)	Application Reference
A	9020125	0.125	0.10	0.005	30	10 µm	10 ±1	0.5–0.6	40–60	Slice silicon, crystal and others
B	9020145	0.145	0.12	0.005	40	10 µm	10 ±1	0.5–0.6	40–60	Slice silicon, crystal and others
C	9020025	0.25	0.18	0.01	75	30–40 µm	15 ±1	0.5–0.6	20–30	Slice sapphire, CaF_2, crystal, glass, W alloy, NdFeB and others
D	9020031	0.31	0.22	0.01	140	30–40 µm	15 ±1	0.5–0.6	70–90	Crop silicon, sapphire, cut filament and others
E	9020035	0.35	0.25	0.02	160	40–50 µm	15 ±1	0.5–0.6	30–40	Square silicon and others
F	9020037	0.37	0.27	0.02	190	40–50 µm	15 ±1	0.5–0.6	30–40	Square silicon and others
G	9020042	0.42	0.32	0.02	230	40–50 µm	15 ±1	0.5–0.6	30–40	Square silicon and others

NOT LIMITED TO STANDARD SIZES



CUSTOM DIAMOND WIRE — MADE TO YOUR SPECIFICATION

Wire Outer Diameter
50–520 µm (spools) · 80–350 µm (loops)

Core Diameter
40–400 µm

Core Material
High-tensile steel, stainless steel, tungsten, molybdenum, NiTi & specialty alloys

Diamond Grit Size
5–50 µm

Bond
Electroplated nickel, resin, multi-layer (loops: electroplated)

Configuration
Continuous, segmented, multi-layer / spiral, hybrid

Break Load
6–320 N

Spool Length
30–1000 m · any spool

Loop Length
600–1500 mm, larger for production

Send your wire saw model and material with the **Application Data Sheet (page 27)** or the **spool drawing (page 09)** — we will recommend or build the right wire.

STANDARD CROSS SECTIONS

To relative scale — diamond held on the core by a tough electroplated nickel bond



REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

SMART CUT® DIAMOND WIRE SPOOLS

Bobbin-based wire for long cuts, large blocks and industrial-scale production



SMART CUT® diamond wire is supplied on spools of all sizes — standard 0.12 mm to 0.42 mm diameters, for just about any wire saw machine

Spool wires are wound onto reels and continuously fed through the workpiece. They are designed for long cuts and large material blocks.

Today most diamond wire is wound around 2, 3, or 4 grooved mandrels to allow multiple loops for simultaneous slicing of the same ingot, so hundreds of wafers can be sliced at once with the same continuous wire.

Spool sizes with photos PAGE 08 ›

Specify your spool (fillable drawing) PAGE 09 ›

Item numbers & full specifications PAGE 06 ›

SPECIFICATIONS

Wire Outer Diameter	50–520 µm
Core Diameter	40–400 µm
Diamond Grit Size	5–50 µm
Break Load	6–320 N
Spool Lengths	30–1000 m (custom lengths available)
Min. Pulley Diameter	40–250 mm

ADVANTAGES

- Suitable for cutting large blocks of stone, silicon ingots, and ceramics
- Flexible for many industries including solar and composites
- Lower machine cost (though higher wire consumption)
- Hundreds of wafers sliced at once with the same continuous wire
- Long spool lengths, 30–1000 m — fewer wire changes
- Available on any spool for just about any wire saw machine
- Increase cutting speed — 3 to 5 times cutting rate of abrasive slurry
- Very low kerf loss — less wasted material
- No slurry recycling and disposal

DIAMOND WIRE APPLICATIONS

Stone slabs | **Photovoltaic silicon blocks** | **Ceramics** | **Composites** | **Industrial-scale production**



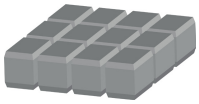
MULTI-WIRE SLICING

One continuous wire from the spool forms the wire web



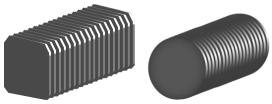
CROPPING

Single crystalline silicon ingot
Sapphire ingot



SQUARING

Single crystalline silicon ingot
Poly crystalline silicon jumbo-ingot



SLICING

Mono-/poly-silicon wafer
Sapphire wafer
Silicon carbide (SiC) wafer

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

SMART CUT® DIAMOND WIRE SPOOL SIZES

Seven standard diameters, A to G — full specifications on **page 06**

B



Ø 0.145 MM

ITEM NO.	CORE Ø	DIAMOND
9020145	**0.12 mm**	**10 µm**

Slice silicon, crystal and others

C



Ø 0.25 MM

ITEM NO.	CORE Ø	DIAMOND
9020025	**0.18 mm**	**30–40 µm**

Slice sapphire, CaF_2, crystal, glass, W alloy, NdFeB

D



Ø 0.31 MM

ITEM NO.	CORE Ø	DIAMOND
9020031	**0.22 mm**	**30–40 µm**

Crop silicon, sapphire, cut filament

E



Ø 0.35 MM

ITEM NO.	CORE Ø	DIAMOND
9020035	**0.25 mm**	**40–50 µm**

Square silicon and others

ALSO STANDARD

A — **Ø 0.125 mm**
Item 9020125 · core 0.10 mm · 10 µm diamond
Slice silicon, crystal and others

F — **Ø 0.37 mm**
Item 9020037 · core 0.27 mm · 40–50 µm diamond
Square silicon and others

G — **Ø 0.42 mm**
Item 9020042 · core 0.32 mm · 40–50 µm diamond
Square silicon and others



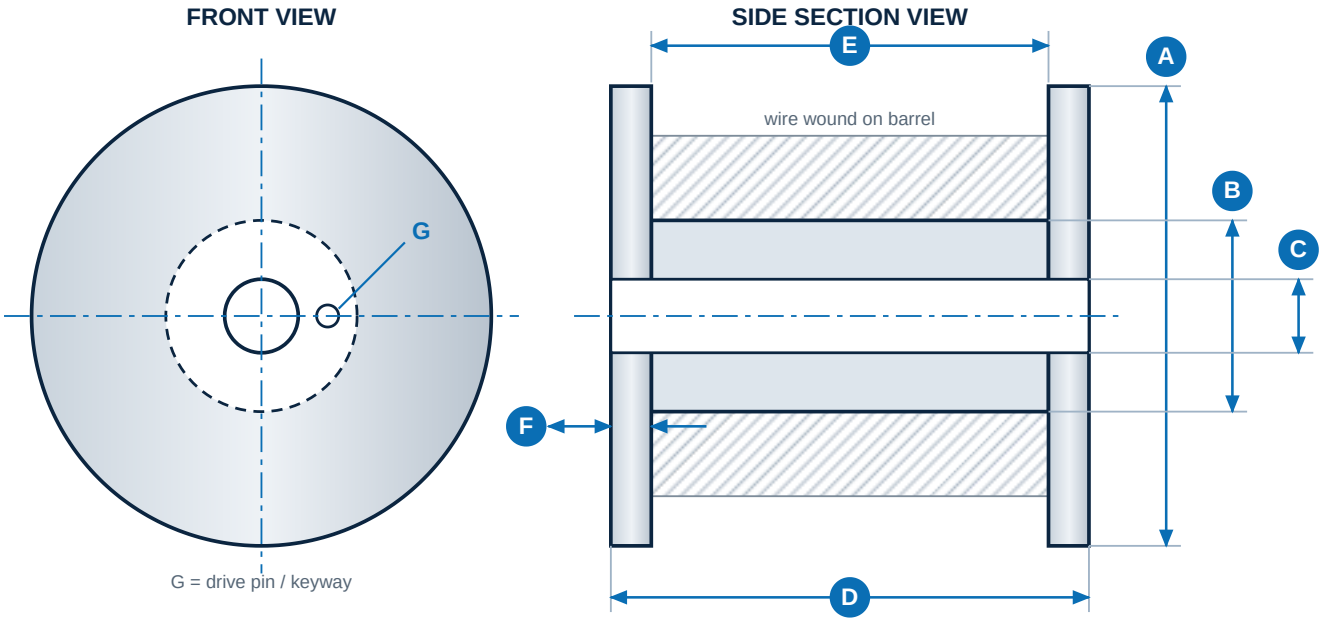
ANY SPOOL, ANY MACHINE

Need a different spool or flange? Fill in the spool drawing on **page 09** with your dimensions, wire saw make and model, and we will supply the wire on the spool your machine takes.

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

SPECIFY YOUR SPOOL

Fill in your spool dimensions and wire specification — type into this PDF, save it and email it to UKAM



Drawing not to scale. Not sure of a dimension? Leave it blank and send us a photo, drawing or sample spool.

1 SPOOL DIMENSIONS

	Dimension	Your value (mm or in)
A	Flange outer diameter	
B	Barrel (hub) diameter	
C	Bore / arbor diameter	
D	Overall width	
E	Inside width between flanges	
F	Flange thickness	
G	Drive pin / keyway (size & position)	

2 WIRE & ORDER

2.1	Wire diameter [mm]	
2.2	Core diameter / material	
2.3	Diamond grit size [µm]	
2.4	Wire length per spool [m]	
2.5	Winding tension [N]	
2.6	Spool material	
2.7	Wire saw make & model	
2.8	Material to be cut	
2.9	Quantity of spools	

3 NOTES & SPECIAL REQUIREMENTS

3.1	Anything else we should know (spool drawing no., flange type, packaging)	

Company: _____ **Name:** _____

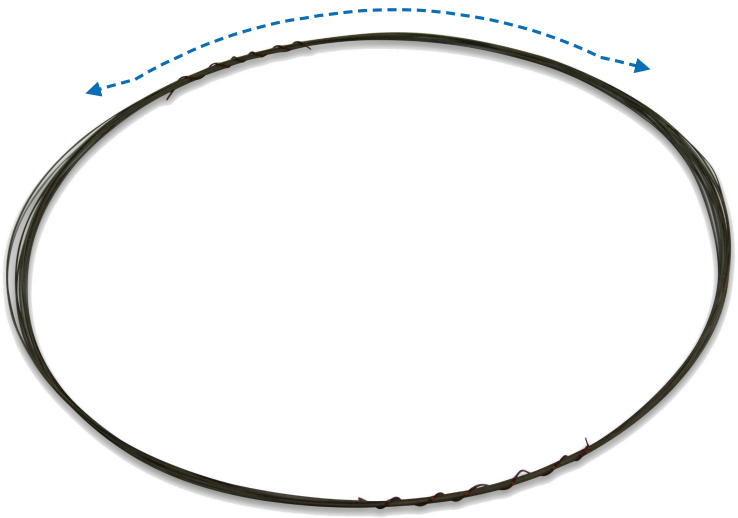
Email: _____ **Phone:** _____

EMAIL YOUR SPOOL SPEC TO UKAM ›

1 Type in the fields **2** Save the PDF **3** Attach it to the email to **lel@ukam.com**
Or fax to 661-257-3833. Questions? Call **661-257-2288**.

SMART CUT® DIAMOND WIRE LOOPS

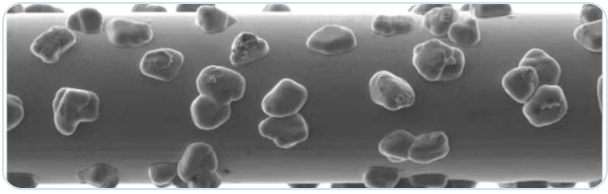
Closed-loop precision wire for wafers, optics and crystals



Loop length is measured around the loop



Close-up of continuous diamond wire



Diamond particles on the wire, SEM view

SMART CUT® Diamond Wire Loops are closed-loop precision tools mounted on pulleys and designed for high-accuracy cutting of wafers, optics, and crystals. Unlike spool-based systems, loop wires maintain stable and consistent tension across the entire loop, ensuring repeatable performance, minimal vibration, and extremely clean cuts. This makes them the preferred choice in laboratories, research facilities, and advanced production environments where tolerances are tight and surface quality is critical. They are manufactured with wire diameters ranging from 80 to 350 µm, using core materials such as high-tensile steel, tungsten, molybdenum, and NiTi alloys.

APPLICATIONS Semiconductor wafers | Sapphire | Quartz | Advanced optics | R&D

SPECIFY YOUR LOOP

1	2	3	4	5
LOOP LENGTH	**WIRE DIAMETER**	**CORE MATERIAL**	**DIAMOND GRIT**	**BOND TYPE**
600–1500 mm (larger for production)	80–350 µm	High-tensile steel, tungsten, molybdenum, NiTi alloys	5–50 µm	Electroplated (nickel) — all loops are electroplated

Tensile strength 2000–4000 MPa • Wire speed range 0.5–20 m/s • Every loop is made to your specification

ADVANTAGES

- Long service life due to even wear
- Capable of ultra-thin kerf widths
- High stability, minimal vibration
- Improve return on investment — less initial capital required
- Preferred in laboratory and production environments requiring repeatability

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

TYPES OF *SMART CUT®* DIAMOND WIRE LOOPS

Continuous and segmented loops — all electroplated, each configuration suits a different job

Diamond grit sizes from 5 to 50 µm with an electroplated nickel bond allow customization for specific applications. Loop lengths typically range from 600 to 1500 mm, with larger formats available for production. With tensile strengths of 2000 to 4000 MPa and wire speed ranges from 0.5 to 20 m/s, these loops are engineered for both stability and durability. Diamond Wire Loops are widely applied in the semiconductor industry for wafer slicing, in optics and photonics for quartz and sapphire processing, and in research and development environments where consistency is essential. Their closed-loop design ensures a long service life through even wear, the ability to achieve ultra-thin kerf widths only slightly larger than the wire diameter itself, and extremely stable cutting with minimal vibration. Variations include continuous diamond wire for uniform cutting and smooth surfaces, and segmented diamond wire with gaps for chip clearance and reduced cutting temperature. Together these configurations make Diamond Wire Loops one of the most precise and versatile solutions available for advanced material processing.

CONTINUOUS DIAMOND WIRE LOOP





Close-up of the wire

- Fully coated with diamonds for uniform cutting
- Produces smooth surfaces and narrow kerfs
- Ideal for semiconductors, optics, ceramics

SEGMENTED DIAMOND WIRE LOOP





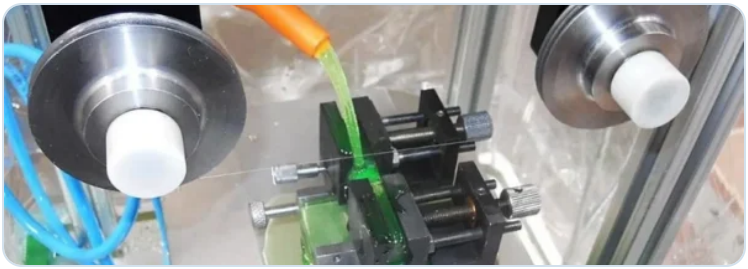
Close-up of the wire

- Diamond-coated intervals with gaps for chip clearance
- Lower cutting temperature, prevents clogging
- Suitable for silicon ingots, ceramics, composites

EVERY LOOP IS ELECTROPLATED

- Single layer of diamond in a tough nickel bond
- Diamonds protrude for a free, fast cut
- Keeps its shape and diameter through its life

Need the speed/finish balance of multi-layer or spiral-coated wire? It is available on spools — see page 15.



Diamond wire loop running on a precision laboratory wire saw

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

DIAMOND WIRE CONFIGURATIONS

The abrasive layout along the wire determines speed, finish, chip clearance and wire life

CONTINUOUS

SEE PAGE 13 ›



Abrasive layout	Entire length coated, no gaps
Main strength	Smoothest surfaces, narrowest kerf, least vibration
Trade-off	More limited chip clearance & coolant flow
Typical uses	Semiconductor wafers, sapphire, quartz, optics

SEGMENTED (INTERVAL-COATED)

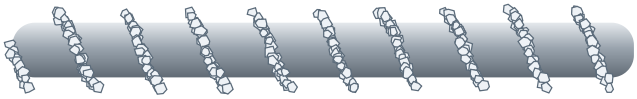
SEE PAGE 14 ›



Abrasive layout	Abrasive zones separated by uncoated intervals
Main strength	Cooler cutting, resists clogging, higher throughput
Trade-off	Not always the finest finish or kerf control
Typical uses	Silicon & SiC ingots, ceramics, composites

MULTI-LAYER / SPIRAL-COATED

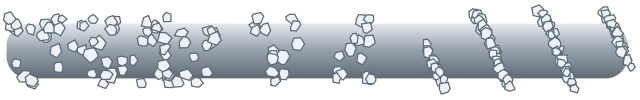
SEE PAGE 15 ›



Abrasive layout	Several abrasive layers or a spiral arrangement
Main strength	Balance of speed, finish and tool life
Trade-off	Not optimized for extremes; more complex to produce
Typical uses	PV silicon wafers, ceramics, composites, specialty glass

HYBRID

SEE PAGE 16 ›



Abrasive layout	Mixed zones and/or bond types in one wire
Main strength	Versatility across materials and changing parameters
Trade-off	—
Typical uses	Composites, ceramic–glass hybrids, semiconductor devices

Illustrations, not to scale.



Continuous diamond wire



Segmented (interval-coated) diamond wire

Not sure which configuration fits your material? Send the **Application Data Sheet on page 27** and a UKAM applications engineer will recommend one.

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SMART CUT® CONTINUOUS DIAMOND WIRE

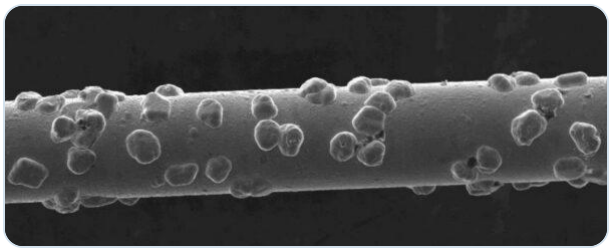
Fully coated along its entire length for uniform cutting, smooth surfaces and narrow kerfs



Illustration, not to scale: diamond abrasive covers the entire wire with no gaps or uncoated areas.



Continuous diamond wire



Diamond-coated wire, SEM view

SMART CUT® Continuous diamond wire is manufactured by coating the entire length of the wire with diamond abrasives, leaving no gaps or uncoated areas. This uninterrupted design ensures that every portion of the wire contributes to the cutting process, which results in uniform engagement between the abrasive and the material. The continuous contact reduces fluctuations in cutting pressure, leading to a stable process with predictable results.

Because the cutting edge is always in contact with the workpiece, continuous diamond wire is known for producing exceptionally smooth surfaces and narrow kerf widths. This reduces material waste, increases yield, and minimizes the need for secondary finishing steps such as grinding or polishing. In delicate materials such as semiconductor wafers, sapphire, quartz, and advanced ceramics, continuous wire helps avoid micro-cracks, thermal stress, and subsurface damage that could compromise part performance.

Another advantage is its compatibility with precision cutting machines that operate at controlled speeds and feed rates. Continuous wires are less prone to vibration compared to segmented wires, which translates into greater accuracy and longer tool life when used under proper operating conditions. This makes them the preferred choice in industries where tight tolerances, repeatability, and surface quality are critical, such as microelectronics, photonics, and optics.

However, continuous wires do have trade-offs. Because the diamond abrasive layer covers the entire wire, chip clearance and coolant flow can be more limited compared to segmented designs. This means operators must use optimized coolant delivery systems and controlled feed rates to avoid clogging and maintain efficient cutting. For large block cutting or highly abrasive materials, continuous wire may not be as efficient as segmented wire, but for precision applications, it remains the industry standard.

ADVANTAGES

- Uniform cutting action
- Consistent engagement
- Exceptionally smooth surfaces and narrow kerf widths
- Minimized need for secondary finishing
- Lower risk of micro-cracks, thermal stress, and subsurface damage
- Less prone to vibration
- Compatible with precision cutting
- Preferred choice in industries requiring tight tolerances, repeatability, and surface quality

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SMART CUT® SEGMENTED DIAMOND WIRE

Interval-coated wire with built-in chip clearance for cooler, cleaner cutting



Segmented diamond wire — diamond-coated intervals with gaps between them



Illustration, not to scale: uncoated intervals act as chip clearance pockets for debris and coolant



Segmented diamond wire loop

SMART CUT® Segmented (interval-coated) diamond wire is engineered with abrasive zones separated by uncoated intervals. The purpose of this design is to give the wire built-in chip clearance pockets, which allow cutting debris, slurry, and coolant to circulate freely around the wire. This reduces the chance of clogging, lowers the cutting temperature, and keeps the diamonds exposed for longer periods. The result is a wire that can maintain performance even when cutting materials that tend to load or generate heavy swarf.

This configuration is especially valuable in semiconductor ingot slicing, advanced ceramics, composites, and other high-density or abrasive materials. In these cases, a fully coated wire might overheat or glaze because there is no room for the debris to escape. By spacing out the abrasive zones, segmented wire maintains cutting efficiency without the same risk of overheating.

The trade-off is that segmented wire does not always achieve the ultra-smooth surfaces or the finest kerf control that continuous wire can provide. Instead, it prioritizes cooler operation, stable cutting speeds, and longer effective wire life. For example, in silicon or SiC ingot processing, segmented wire allows higher throughput while still producing wafers with acceptable surface quality for subsequent polishing. In ceramic and composite processing, it minimizes breakage and extends tool life compared to fully coated wires.

SEGMENTED WIRE VS. BEADED WIRE

It is important to distinguish segmented (interval-coated) wire from beaded diamond wire used in stone cutting. Beaded wire is built with discrete diamond-impregnated beads strung on a steel cable, intended for quarrying or cutting massive stone blocks. In contrast, interval-coated segmented wire is a precision cutting tool developed for electronics, optics, and advanced materials, where the focus is on controlled chip evacuation and improved reliability rather than rough shaping.

When applied with proper tension, coolant delivery, and feed rates, segmented diamond wire provides a strong balance of cutting efficiency, durability, and cost-effectiveness, particularly in industries where productivity and throughput are as important as precision.

ADVANTAGES

- Built-in chip clearance pockets
- Reduced risk of clogging
- Lower cutting temperature
- Extended exposure of diamonds
- Stable cutting speeds
- Higher throughput
- Minimized breakage
- Longer effective wire life
- Cost-effective solution

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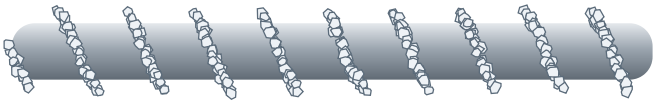
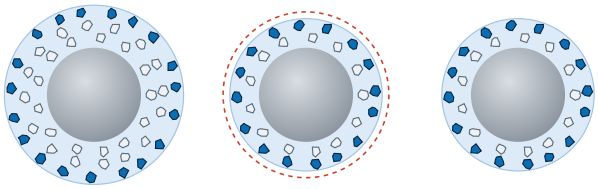
SMART CUT® MULTI-LAYER OR SPIRAL-COATED DIAMOND WIRE

Several diamond layers, or a spiral arrangement, for a balance of speed, finish and tool life

SPIRAL-COATED WIRE



MULTI-LAYER WIRE — CROSS SECTION



New: outer layer cuts | **Outer diamonds wear away** | **Next layer exposed:** fresh edges

Illustrations, not to scale. **Spiral** describes the coating pattern along the wire; **multi-layer** describes the number of abrasive layers. They are available separately or combined.

SMART CUT® Multi-layer or spiral-coated diamond wire is designed to combine the benefits of speed, surface finish, and tool life. Instead of relying on a single uniform coating, these wires are built with several layers of diamond abrasive or a spiral arrangement along the wire's length. This design places more cutting points in contact with the material, which improves efficiency while keeping the cutting action stable. The spiral spacing also creates natural channels for debris and coolant evacuation, reducing the chance of clogging and helping the wire stay cooler during operation.

Because multiple layers of abrasive are present, new cutting edges are exposed as the outer diamonds wear away. This extends tool life beyond what is possible with single-layer electroplated wires. At the same time, the wire maintains a sharper and more consistent cutting action than resin bond wires, which typically cut more slowly. The result is a balanced performance, offering faster cutting than resin systems and smoother surfaces than aggressive electroplated wires.

These qualities make multi-layer or spiral-coated wires well suited for mid-range applications where both throughput and surface quality are important. They are widely applied in photovoltaic silicon wafer slicing, advanced ceramics, composites, and specialty glasses. In these areas, they provide reliable performance without sacrificing finish quality or generating excessive heat. They are also valued in research and prototyping, where one versatile wire may be required to handle different materials efficiently.

The main limitation of spiral-coated wires is that they are not optimized for extremes. Electroplated wires remain superior for maximum cutting speed, while resin bond wires are better for ultra-delicate substrates where minimizing chipping and microcracking is critical. Cost can also be a factor, since producing spiral or multi-layer wires is more complex. Even so, for many industrial users, the balance of speed, finish, and longevity makes them a cost-effective solution for demanding but versatile cutting requirements.

WHERE MULTI-LAYER WIRE FITS

ELECTROPLATED
Maximum cutting speed

MULTI-LAYER / SPIRAL
Balanced: faster than resin, smoother than electroplated, longer life than single-layer

RESIN BOND
Ultra-delicate substrates — least chipping and microcracking

ADVANTAGES

- Multiple cutting points in contact
- Natural channels for debris and coolant evacuation
- Extended tool life
- Sharper and more consistent cutting action
- Balanced performance
- Reliable results in mid-range applications
- Versatile across materials
- Valued in research and prototyping

TYPICAL APPLICATIONS

PV silicon wafer slicing
Advanced ceramics | **Composites**
Specialty glasses
Research & prototyping

SMART CUT® HYBRID DIAMOND WIRE

Continuous, segmented and spiral-coated zones — or different bond types — combined in one wire

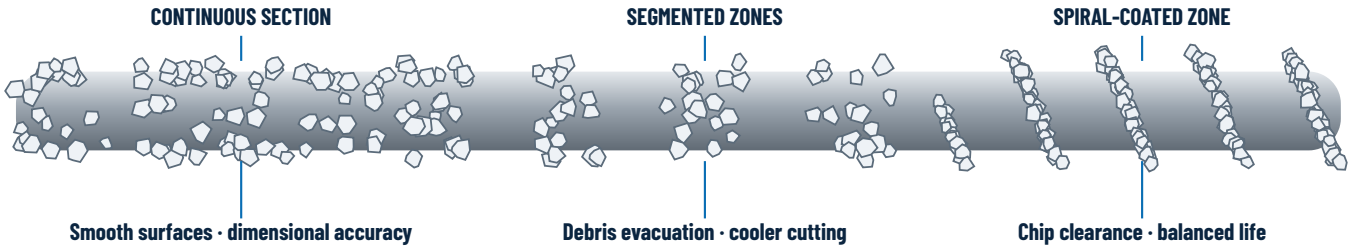


Illustration of one possible hybrid layout, not to scale. Zone lengths and bond types are configured for your material and machine.

Hybrid diamond wires are designed to combine the strengths of multiple abrasive configurations into a single tool. Instead of relying on one coating strategy, these wires may use a mix of continuous and segmented zones or even integrate different bond types such as electroplated, resin, or multi-layer coatings. This allows the wire to deliver greater versatility and adapt to a wider range of cutting conditions without frequent tool changes.

A major benefit of hybrid wires is their ability to cut mixed-material assemblies or multi-layered components. In these situations, a continuous section of the wire ensures smooth surfaces and precise dimensional accuracy, while the segmented or spiral-coated zones promote better debris evacuation and cooler operation.

This balance makes them suitable for applications such as advanced composites, ceramic–glass hybrids, and semiconductor devices where both speed and surface integrity matter.

Hybrid configurations also perform well when cutting parameters vary. They can tolerate changes in feed rate, wire tension, and coolant flow better than single-purpose wires, which reduces downtime and provides consistent performance. This stability is highly valued in industries such as aerospace, photonics, and microelectronics, where small variations in cut quality can lead to expensive rework or rejected parts.

WHY CHOOSE A HYBRID WIRE

01
MIXED-MATERIAL PARTS
Cuts mixed-material assemblies and multi-layered components in one pass

02
VARYING PARAMETERS
Tolerates changes in feed rate, wire tension and coolant flow better than single-purpose wires

03
FEWER TOOL CHANGES
Adapts to a wider range of cutting conditions — less downtime, consistent performance

TYPICAL APPLICATIONS
- Advanced composites
- Ceramic–glass hybrids
- Semiconductor devices
- Multi-layered components

INDUSTRIES
- Aerospace
- Photonics
- Microelectronics

Every hybrid wire is configured to the job. Send the **Application Data Sheet on page 27** with your materials and machine, and a UKAM applications engineer will recommend the zone layout and bond.

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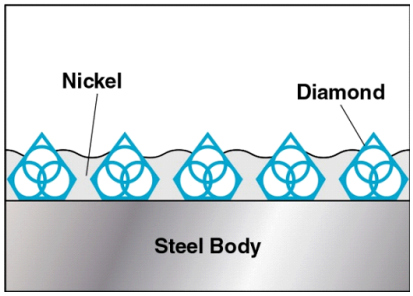
TYPES OF DIAMOND WIRE BY BOND

Electroplated nickel for maximum speed — resin for the most delicate substrates

SMART CUT® ELECTROPLATED DIAMOND WIRE

Nickel Bond (electroplated)



Single layer of diamond held by a tough nickel bond

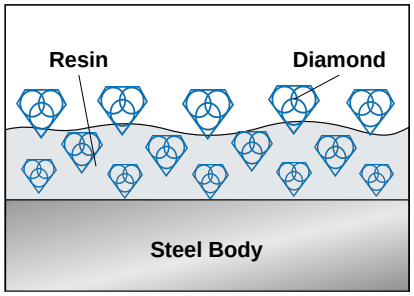
Electroplated diamond wire is made with a single layer of diamond particles bonded with nickel plating, providing very sharp cutting edges, aggressive performance, and high throughput. It is widely used for semiconductor wafers, sapphire, optical crystals, and glass substrates, where speed and precision are essential. The design ensures consistent sharpness and fast material removal.

ADVANTAGES

- Provides the fastest cutting speeds
- Consistent sharpness throughout its working life
- Ideal for high-volume wafer slicing and precision industries
- Excellent for materials that require aggressive, efficient cutting

SMART CUT® RESIN BOND DIAMOND WIRE

Resin Bond



Diamond embedded throughout a resin matrix that wears to expose fresh diamond

Resin bond diamond wire is produced by embedding diamond particles in a resin matrix, which gradually wears away during cutting to expose fresh, sharp diamonds. This creates a self-renewing cutting surface that ensures consistent performance, smoother cuts, and reduced chipping compared to electroplated wire. Because of its controlled cutting action, it generates lower cutting forces and less heat, making it ideal for delicate or brittle materials such as advanced ceramics, thin glass, composites, and optical substrates.

ADVANTAGES

- Self-renewing cutting surface
- Smoother surface finishes
- Lower cutting forces
- Minimal heat generation
- Extended tool life
- Greater process reliability

Bond Type — Which to Choose	Diamond Layer	Cutting Action	Surface Finish	Best For
Electroplated (nickel)	Single layer, diamonds protrude from the nickel bond	Fastest, most aggressive	Good	High-volume wafer slicing, sapphire, optical crystals, glass
Resin	Diamonds embedded in a resin matrix that renews itself	Controlled, low force, low heat	Smoothest, least chipping	Advanced ceramics, thin glass, composites, optical substrates
Multi-layer construction	Several abrasive layers; new edges exposed as outer layer wears	Faster than resin, longer life than single-layer	Smoother than electroplated	PV silicon wafers, ceramics, composites, specialty glass

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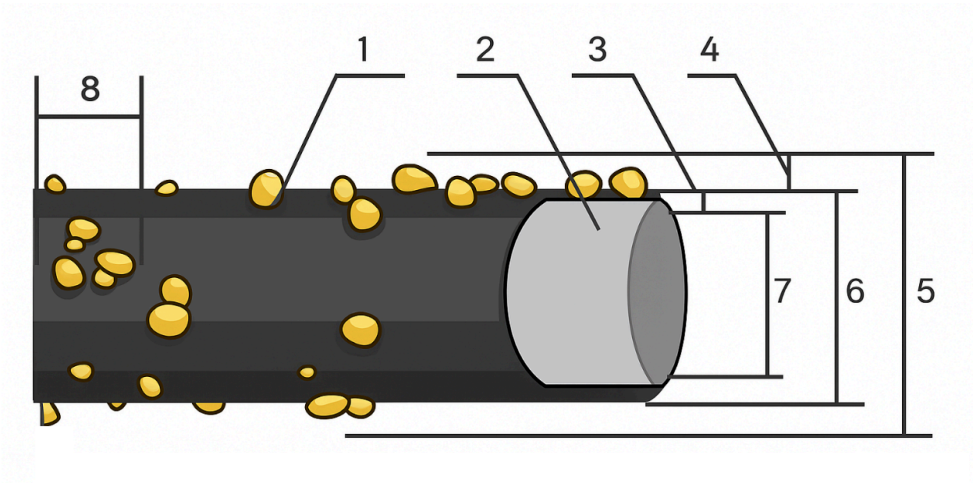
DIAMOND WIRE STRUCTURE

Anatomy of an electroplated ***SMART CUT***® diamond wire saw



THE WIRE

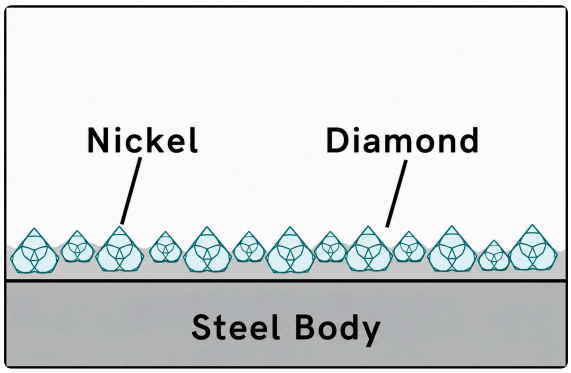
1. Wire saw product
2. Wire saw matrix (bare wire)
3. Coating layer thickness
4. Abrasive cutting layer height

THE DIAMETERS

5. Envelope diameter of the wire saw (including abrasive layer)
6. Total wire saw diameter
7. Core wire (bare wire) diameter
8. Diameter of accumulated abrasive particles

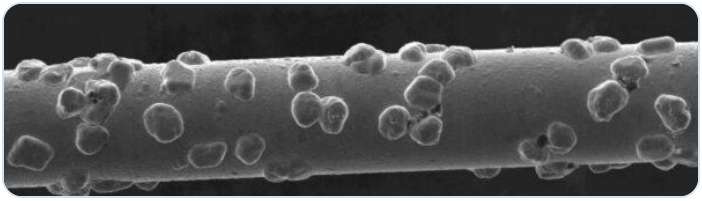
ABOUT NICKEL BOND (ELECTROPLATED) TOOLS

Electroplated (nickel bond) diamond products usually have a single layer of diamonds, held by a tough, durable nickel alloy. Nickel is frequently used as a base for plating diamond because of its excellent strength, toughness and flexibility during the plating process. Electroplated diamond products are able to retain their original shape and dimensions throughout their working life, unlike sintered (metal bond) or resin bond diamond products, where diamond particles are buried in the bond and held together by a metal or resin binder deep inside. Electroplating allows diamond particles to protrude from the bond matrix, providing a free, faster cutting action with minimum heat generation.

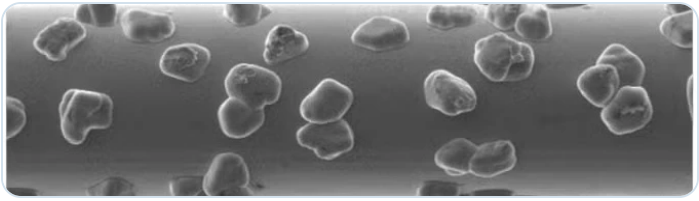


Single layer of diamond held by a tough nickel bond

SEM VIEWS OF *SMART CUT*® DIAMOND WIRE



Diamond particles protrude from the nickel bond for a free, fast cut

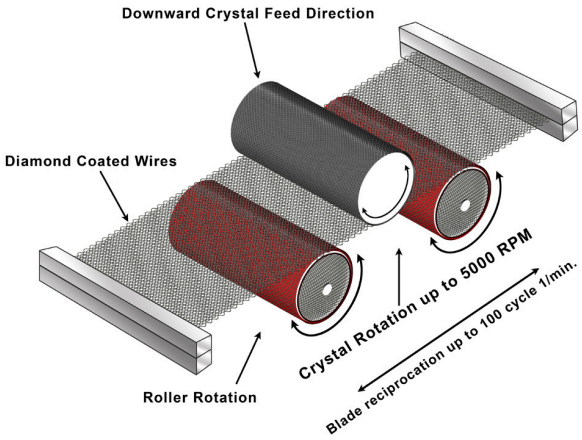


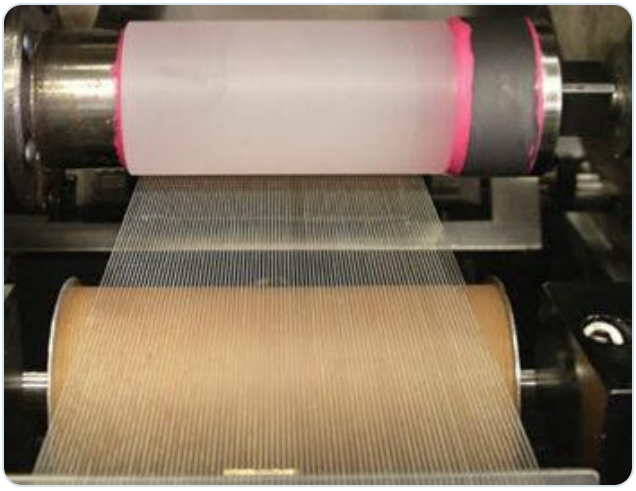
Close-up of diamond crystals on the core wire

HOW DIAMOND WIRE WORKS

One continuous diamond-coated wire, wound across grooved rollers, slices hundreds of wafers at once

Diamond wire saws provide the most accurate cutting with the least amount of material deformation and chipping of material. Today diamond wire sawing is preferred by the majority of solar silicon manufacturers, crystal growers and advanced ceramic manufacturers over other technologies and cutting methods.





Diamond wire web on the grooved wire-guide rollers

1 WIRE WEB

The wire is wound around 2, 3 or 4 grooved mandrels, forming many parallel loops across the ingot.

2 CUTTING ACTION

As the wire runs across the ingot, diamond particles lap and grind material away at the micro level.

3 RECIPROCATING MOTION

The wire moves forward, then retracts a shorter distance, so fresh wire is advanced each cycle.

4 HUNDREDS OF SLICES

Every loop cuts at once, so hundreds of wafers are sliced with the same continuous wire.

A diamond wire saw operates similarly to a horizontal hack saw, where a head containing a pack of blade lengths of plain edge stainless or spring steel, mounted parallel to the head travel, oscillates back and forth over the workpiece or pieces mounted on a bed. The bed can be fed up into the blades at selected pressures. The diamond wire provides cutting or lapping action between the blades and material. The wire saw allows slicing of hundreds of wafers simultaneously with the same continuous wire.

Today most diamond wire is wound around 2, 3, or 4 grooved mandrels in order to allow multiple loops for simultaneous slicing of the same ingot. When the looped wire is running across the ingot, the diamond particles on the surface of the wire slowly lap and grind off silicon at the micro level (bit by bit). The cutting action is done by reciprocating motion. The wire is used once, and replaced with a new roll.

Typically this type of wire saw can travel at a surface speed of 6 m/sec. The wire moves forward for about 300 m and is retracted for about 200 m. Net advance of the new wire is at an average speed of 2 m/sec, with about 100 m of new wire passed through each cycle. The wire can run continuously for more than 300 km. More than 500 slices can be sawn simultaneously. In a production environment an 8″ (200 mm) silicon boule can be cut in less than 8 hours and a 12″ (300 mm) boule in less than 12 hours.

500+	300+ km	< 8 h	< 12 h
slices sawn simultaneously	of continuous wire run	8″ (200 mm) silicon boule	12″ (300 mm) silicon boule

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WHY USE DIAMOND WIRE

From abrasive slurry to fixed diamond: faster, cleaner and more accurate

THE PAST: ABRASIVE SLURRY

Copper-plated piano wire | **Loose SiC / alumina** | **Oil or water slurry**

In the past, abrasive slurry wire saws were the main method used for cutting these ultra-hard and brittle materials. Copper-plated piano wire was used to trap abrasive particles (such as alumina or SiC) suspended in mineral oil or water-based coolant, to provide the cutting action and lubrication of the moving wire. The wire diameter used was smaller than 0.15 mm and the cutting kerf was about 0.15 mm to 0.19 mm. Abrasive slurry grit ranged from 1000 to 250 grit. Viscosity and continuous mixing of the slurry must be maintained in order to produce consistent results.

›

TODAY: DIAMOND WIRE

Diamond fixed to the wire | **No slurry** | **Industry standard**

The improvement in diamond wire manufacturing technology and reduction in cost has made diamond wire cutting an industry standard. **Wire bonded with diamond offers many advantages in terms of faster cutting speed (frequently triple the speed) and improved surface finish quality (fewer secondary operations such as polishing).** Using diamond wire is a much cleaner and faster process.

~3×	Fewer
cutting speed, frequently	secondary operations

WHY USE DIAMOND WIRE

Controlled, Low-Stress Cutting

Diamond wire is used because it offers a highly controlled and efficient method of cutting hard and brittle materials while maintaining accuracy and surface integrity. Unlike traditional cutting tools, diamond wire distributes force evenly along its length, which reduces stress, vibration, and heat on the material.

Thin Kerf, Smooth Surfaces

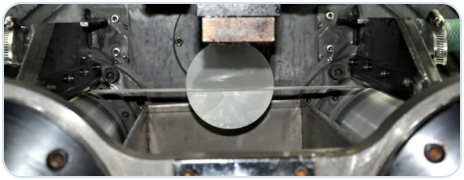
This makes it possible to achieve thin kerf widths, only slightly larger than the wire diameter, and produce smooth surfaces with minimal chipping or microcracking.

Little Heat, Versatile

The process generates very little heat, typically under 20 °C of heat induction versus 40–60 °C with abrasive slurry, which prevents thermal damage, warping, or subsurface fractures in sensitive materials such as semiconductors, sapphire, quartz, and ceramics. Diamond wire is also versatile, capable of cutting both delicate samples and large blocks, depending on the wire type and machine configuration.

Less Waste, Lower Cost

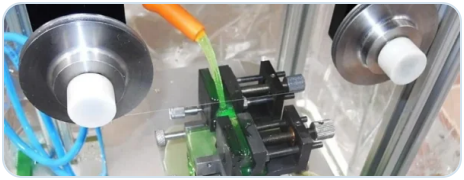
It reduces material waste, often eliminates the need for secondary finishing, and offers longer tool life with the proper bond selection, making it a cost-effective and reliable choice for industries that demand precision, repeatability, and clean cutting results.



Sapphire wafering



Silicon bricking & cropping



Precision loop wire sawing

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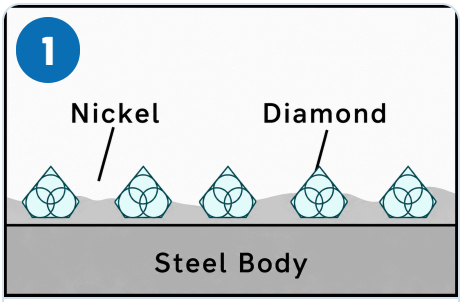
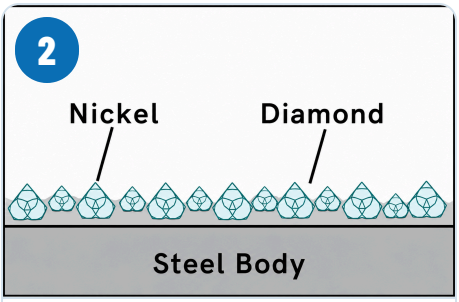
HOW *SMART CUT®* WORKS

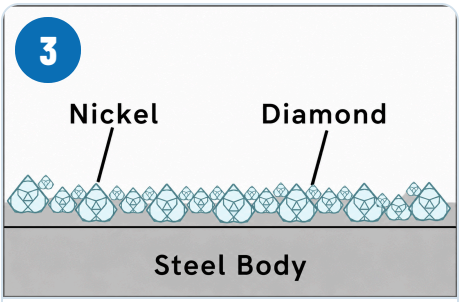
The sharpest and finest quality diamonds in a tough nickel bond penetrate into the material, grinding and polishing as they cut — grit size is matched to your material and finish.



Coarse grit — fastest cut. Large diamond crystals protrude high above the nickel bond. Only the exposed cutting points touch the material, giving aggressive, free cutting with minimum heat — ideal for squaring and cropping large ingots.



Medium grit — balanced performance. A dense layer of mid-size diamonds shares the load, balancing cutting speed, surface finish and wire life for general wafering of silicon, sapphire and crystals.



Fine grit — smoothest finish. Many small, closely spaced diamonds take a lighter cut for minimal chipping and sub-surface damage on thin wafers and delicate optical materials. In every ***SMART CUT®*** wire the tough nickel bond holds each diamond firmly, so the wire keeps its shape and diameter throughout its working life.

PARAMETERS AFFECTING DIAMOND WIRE PERFORMANCE

Two factors set the starting point — six more decide how well the wire performs on your machine

WIRE DIAMETER
Sets the kerf width and break load — matched to the slice thickness and your wire saw.

MATERIAL BEING CUT
Hardness and brittleness decide the diamond grit, bond and cutting parameters.

SPEED
Wire speed sets the cutting rate and how fast the wire wears.

PRESSURE
Feed pressure and wire tension control cut rate, wire bow and accuracy.

DIAMOND RETENTION
How securely the bond holds each diamond on the wire through the cut.

CUTTING FLUID
Wets the kerf, removes heat and flushes debris away.

MATERIAL PREPARATION
How the workpiece is mounted and prepared before cutting.

PROCESS
Machine setup — wire run method, rocking and end-of-cut dwell.

Optimizing wire speed, feed pressure, coolant and material preparation for your specific machine is what turns a good wire into a great process. UKAM applications engineers help set these parameters for each application.



THE RIGHT CUTTING FLUID MATTERS

For silicon cropping and squaring, pair ***SMART CUT®*** diamond wire with ***SMART CUT®*** HD-2B synthetic low-IFT coolant/lubricant for longer wire life, more accurate cuts and lower subsurface damage.

SEE HD-2B, PAGE 25 ›

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CASE STUDIES & CUTTING RESULTS

Production data from diamond wire sawing of sapphire and silicon



CASE STUDY 01

Sapphire Wafering

2″ sapphire ingot on a multi-wire saw

180 min	3.2 m
cut time	wire consumption per wafer

CUTTING PARAMETERS

Wire speed	**10 m/s**
Cutting tension	**35 N**
Cut speed	**0.28–0.35 mm/min**
Cut time	**180 min**
Wire consumption	**3.2 m/wafer**

Photo: sapphire ingot wafering on a diamond wire saw



CASE STUDY 02

Silicon Bricking

Diamond wire cutting results on a production wire squarer

2:35 h	Ra < 3 µm
cutting time per ingot	surface roughness

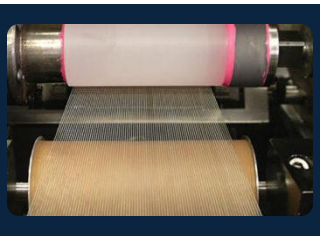
CAPACITY

Cutting time per ingot	**2:35 hours**
Downtime between cuts	**0:20 hours**

PRECISION

Surface roughness	**Ra < 3 µm**
Tolerance	**± 0.25 mm**
Parallelity / flatness	**0.25 mm**
TTV	**0.5 mm**
Perpendicularity	**90° ± 0.2°**

Photo: silicon bricking and cropping



PROVEN IN PRODUCTION

SMART CUT® diamond wire is used on multi-wire saws for sapphire wafering, on wire squarers for silicon bricking and cropping, and on multi-wire slicers for silicon wafers. Send us your machine model and process parameters and we will match the wire diameter, grit, core and bond to your equipment.

REQUEST A QUOTE › TALK TO AN ENGINEER: 661-257-2288 APPLICATION DATA SHEET P. 27 › VIEW ONLINE ›

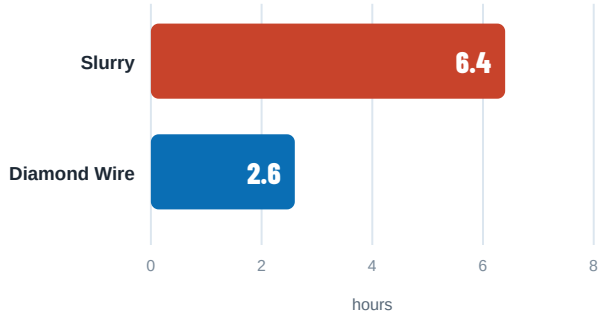
SLURRY VERSUS DIAMOND WIRE: INGOT SQUARING

Silicon ingot squaring and bricking — conventional abrasive slurry compared with diamond wire

Feature	Slurry	Diamond Wire
Maximum feed rate	0.8 mm/min	**2.0 – 3 mm/min***
Cutting time – 250 mm ingot height	6.4 hours	**2.6 hours**
Capacity – G5 ingot, 156 × 156 mm, 25 bricks/ingot	3.3 cuts/day; 82 bricks/day	**8.3 cuts/day; 207 bricks/day**
Heat induction (temperature rise in the cut)	40 – 60 °C	**< 20 °C**

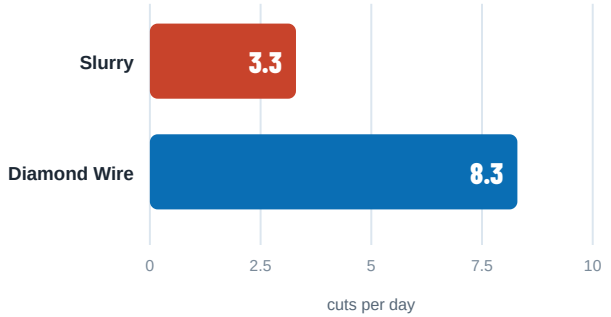
* dependent on ingot quality. Production results on a wire squarer; bricks/day = cuts/day × 25 bricks per ingot. Actual results depend on ingot, machine and process parameters.

CUTTING TIME – 250 MM INGOT HEIGHT



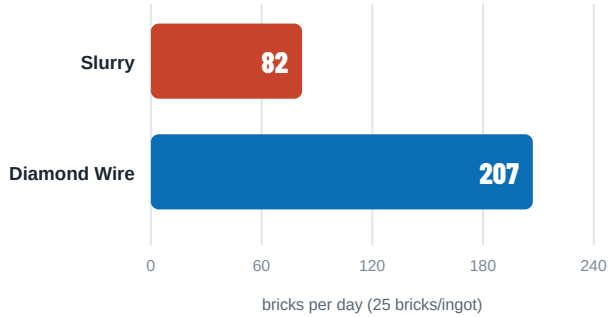
59% LESS CUTTING TIME

CUTS PER DAY – G5 INGOT SQUARING



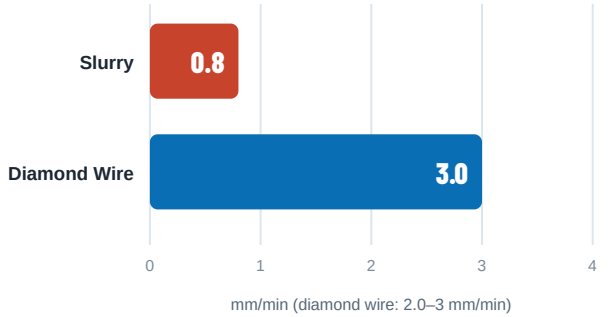
2.5× MORE CUTS PER DAY

CAPACITY – G5 INGOT, 156 × 156 MM



2.5× MORE BRICKS PER DAY

MAXIMUM FEED RATE



UP TO 3.75× FASTER FEED

2.5–3.75×
higher maximum feed rate

207
bricks/day vs. 82 with slurry

8.3
cuts/day vs. 3.3 with slurry

< 20 °C
temperature rise in the cut vs. 40–60 °C

REQUEST A QUOTE ›

TALK TO AN ENGINEER: 661-257-2288

APPLICATION DATA SHEET P. 27 ›

VIEW ONLINE ›

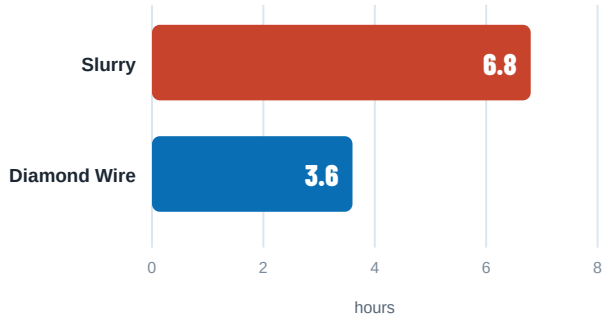
SLURRY VERSUS DIAMOND WIRE: WAFERING

Silicon wafer slicing — slurry versus diamond wire on the same multi-wire saw

Feature	Slurry	Diamond Wire
Feed rate	e.g. 0.42 mm/min	**e.g. 1.0 mm/min**
Cutting time – 156 × 156 mm	6.8 hours	**3.6 hours**
Cutting time – 125 × 125 mm	5.6 hours	**2.6 hours**
Wafers 156 × 156 mm	6,500 wafers/day	**13,800 wafers/day**
Wafers 125 × 125 mm	7,800 wafers/day	**16,100 wafers/day**

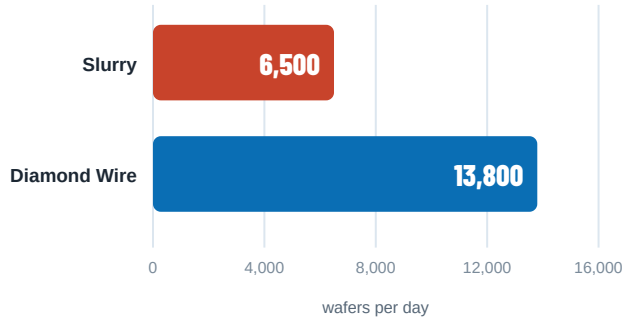
Calculation basis: production multi-wire saw; loading length = 800 mm; wafer thickness = 0.180 mm; core wire thickness = 0.120 mm

CUTTING TIME – 156 × 156 MM WAFERS



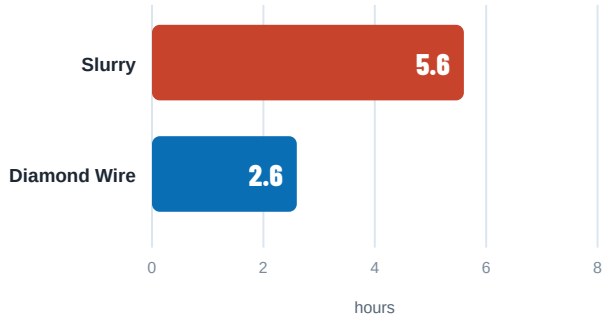
47% LESS CUTTING TIME

WAFERS PER DAY – 156 × 156 MM



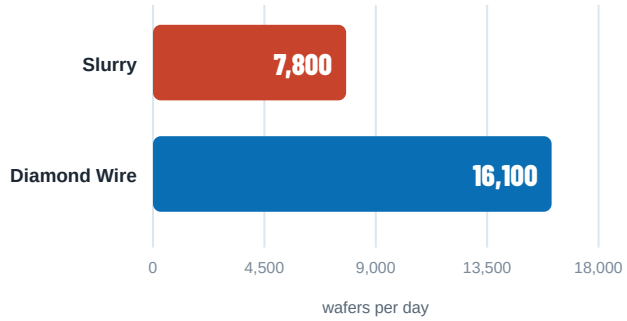
2.1× THE DAILY OUTPUT

CUTTING TIME – 125 × 125 MM WAFERS



54% LESS CUTTING TIME

WAFERS PER DAY – 125 × 125 MM



2× THE DAILY OUTPUT

WHAT THIS MEANS FOR YOUR LINE

On the same multi-wire saw, switching from slurry to diamond wire roughly halves cutting time and doubles daily wafer output — with no slurry to recycle or dispose of. Send us your saw and process data and we will estimate the gain for your line.

DATA SHEET, PAGE 27 ›

REQUEST A QUOTE ›
TALK TO AN ENGINEER: 661-257-2288
APPLICATION DATA SHEET P. 27 ›
VIEW ONLINE ›

SEMICONDUCTOR CRYSTAL CUTTING

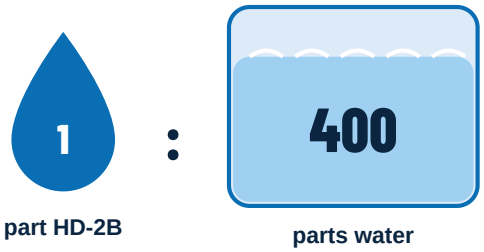
SMART CUT® HD-2B

Synthetic Low IFT Coolant / Lubricant — the recommended coolant for ***SMART CUT®*** diamond wire



Representative container · 5 & 55 gallons

MIXING AT HIGH DILUTION



part HD-2B — parts water

ABOUT 0.25% BY VOLUME · DI WATER BEST

ONCE-THROUGH SYSTEMS ONLY

Apply fresh HD-2B to the cut, then send used fluid to a collection or approved treatment system. Do not recirculate. Do not mix with other coolants.

Fresh HD-2B → Cutting zone → Used fluid out

⊘ Never return to supply

A synthetic wire-slicing coolant and lubricant for cutting semiconductor crystals with fixed-abrasive diamond wire, ID (inside diameter) blades and diamond band saws. It is also used as a non-recirculating edge grinding fluid for silicon wafers and ingots, and is the recommended ***SMART CUT®*** fluid for cropping and squaring silicon slabs and ingots.

PROCESSES AND MATERIALS

Cropping · **Squaring** · **Wafering** · **Ingot slicing** · **Edge grinding** · **Chamfering**

Materials: silicon, sapphire, germanium, single-crystal silicon carbide and II-VI crystals.

LOW INTERFACIAL TENSION, IN PLAIN TERMS

Interfacial tension describes how strongly a liquid resists spreading across a boundary, such as a wire or crystal surface. A low-IFT fluid spreads and penetrates more easily, so it can reach the narrow kerf around a diamond wire or thin blade.

HD-2B is designed for very high dilution. It is **typically evaluated at 1 part HD-2B to 400 parts water (about 0.25% by volume)**. At this dilution water quality matters: deionized water is the best choice because it avoids ion interference with the surfactant base. Softened or tap water can also work if its quality stays stable.

Total thickness variation (TTV) is the difference between the thickest and thinnest points of one wafer. Wafer quality, tool life and throughput depend on the whole process, not on the fluid alone.

APPEARANCE	DENSITY	TYPICAL EVALUATION	PACKAGING
Clear, low-viscosity liquid	About 1.00 g/cm^3	1 : 400 in water	5 gal · 55 gal

Contains no nitrides, phosphates, chromates, phenols, heavy metal salts, petroleum oils, chlorine or phosphorus. Do not add nitrates, nitrites or nitro compounds.

SEMICONDUCTOR CRYSTAL CUTTING

HD-2B APPLICATIONS & HOW IT WORKS



Diamond wire



ID cutting blades



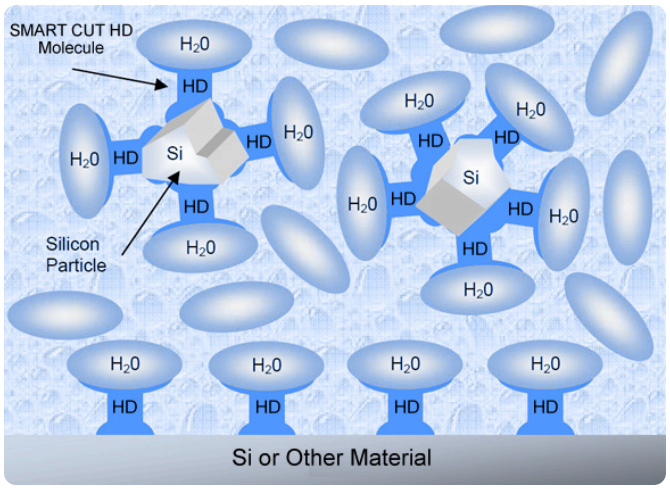
Diamond band saw blades



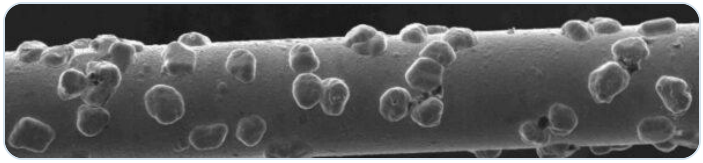
ID slicing of a crystal

HD-2B is used with ***SMART CUT***® diamond wire, ID blades and diamond band saw blades from UKAM.

HOW HD-2B WORKS IN THE CUT



One end of the molecule bonds to silicon, the other to water — so water wets the cut and washes particles away



Diamond grit on a wire core, magnified. HD-2B must wet this surface inside the kerf.

1. **Wets the kerf.** Penetrates the kerf and wets the silicon, diamond and nickel interface.
2. **Removes heat.** Cools the wire or blade quickly at the contact zone.
3. **Keeps the diamond clean.** Detergency keeps the diamond free-cutting and reduces dressing.
4. **Softens and flushes debris.** Saw debris stays soft and easy to flush, so the kerf does not pack.

CUTTING OPERATIONS

Top and tail cut · Cropping · Squaring · Wafering · Ingot slicing · ID sawing

NON-RECIRCULATING GRINDING

Edge · Face · Surface · Back · Double disc grinding · Chamfering

INTENDED RESULTS

- Longer blade and wire life, with less dressing and downtime
- Less blade or wire deflection and more accurate cuts
- Lower subsurface damage, with reduced bow, warp and TTV
- Less exit chipping and substrate tear
- Non-staining, non-corrosive and odor-free on machines

COMMON QUESTIONS

Can HD-2B be recirculated?
No. HD-2B is designed for once-through systems only. Do not recirculate.

Can it be mixed with other coolants?
No. Dilute it in water and use it alone.

How do I judge performance?
Track tool wear, cutting speed, surface finish and debris in the kerf.

Other materials?
It can suit similar materials cut at high speed with diamond tools. Test first.

REQUEST PRICING & AVAILABILITY | VIEW PRODUCT ONLINE › | REQUEST SDS ›

DIAMOND WIRE APPLICATION DATA SHEET

For spool and loop wire — a UKAM applications engineer will recommend the right wire and optimize your process

Company: _____ **Name / Title:** _____

Address: _____ **Phone:** _____

City / State / ZIP: _____ **Email:** _____

Country: _____ **Date:** _____

WIRE TYPE: ☐ Spool wire ☐ Loop wire

Fill in every line that applies. SPOOL ONLY LOOP ONLY lines can be skipped for the other type.

1 MACHINE & WORKPIECE

1.1	Wire saw make & model	
1.2	Single / multi wire	
1.3	Supply traverser(s) [yes / no] SPOOL ONLY	
1.4	Workpiece material	
1.5	Material size / dimensions [mm]	
1.6	Wafer / slice thickness [µm]	
1.7	Mounting procedure	

2 WIRE

2.1	Wire now in use [brand / spec]	
2.2	Core diameter [µm]	
2.3	Grit size & type [µm]	
2.4	Total wire Ø incl. diamond [µm]	
2.5	Wire field width [mm] / no. of wires SPOOL ONLY	
2.6	Loop length [mm] LOOP ONLY	
2.7	Loop saw drive pulley Ø [mm] LOOP ONLY	

3 PULLEYS

		Return pulleys	Guide pulleys
3.1	Number of pulleys		
3.2	Diameter [mm]		
3.3	Material		
3.4	Groove shape		

4 PROCESS

4.1	Wire tension [N]	
4.2	Wire speed [m/s]	
4.3	Wire run method [e.g. incremental] SPOOL ONLY	
4.4	Total wire length [m] SPOOL ONLY	
4.5	Wire reverse length [m] SPOOL ONLY	
4.6	Wire bow [mm]	
4.7	Feed rate 1 [mm/min]	
4.8	Feed rate 2 [mm/min]	
4.9	Feed rate 3 [mm/min]	
4.10	Rocking angle [°]	
4.11	Rocking speed [°/s]	
4.12	End-of-cut dwell [hh:mm:ss]	

5 COOLING & CLEANING

5.1	Coolant medium	
5.2	Coolant ratio	
5.3	Coolant flow [l/h or cc/min]	
5.4	Coolant temperature [°C]	

6 YOUR GOALS

6.1	Problem with current process / reason for inquiry		
6.2	Target kerf / surface finish / TTV	Quantity / monthly usage	
6.3	Spool length [m] or loop length [mm] required	Needed by [date]	

EMAIL COMPLETED FORM TO UKAM ›

1 Type in the fields **2** Save the PDF **3** Attach it to the email to **lel@ukam.com**
Or fax to 661-257-3833. Questions? Call **661-257-2288**.

ORDERING & SUPPORT

Stock specifications, custom wire and expert applications help from an American manufacturer

EMAIL lel@ukam.com
PHONE 661-257-2288
FAX 661-257-3833
WEB ukam.com

WHAT TO INCLUDE IN YOUR QUOTE REQUEST

- Item number (e.g. 9020125) or wire diameter, core and diamond grit
- Spool or loop — spool length [m] or loop length [mm]
- Wire saw make & model and the material you cut
- Quantity and the date you need it

APPLICATION DATA SHEET P. 27 ›
SPOOL DRAWING P. 09 ›

BEST PRICE GUARANTEE

BEST PRICE

UKAM's Best Price Guarantee applies to stock and custom products. **See terms ›**

GUARANTEED TRIAL ORDER

TRIAL ORDER

Try ***SMART CUT®*** diamond wire with a Guaranteed Trial Order. **See terms ›**

CUSTOM MANUFACTURING

Wire diameter, core material, diamond grit size, bond type, spool length and loop length can be made to your specification for your machine and material.

LEAD TIME

Lead time on most items is usually 4 to 5 weeks. Expedited lead time of 1 to 2 weeks is available at additional cost, and some popular specifications may be in stock.

EXPERT TECHNICAL SUPPORT

Talk to a UKAM applications engineer. Send the Application Data Sheet on page 27 and we will recommend the optimal wire and process parameters.

SHIPPING

UKAM ships worldwide via UPS, FedEx and US Mail, plus other shipping options on request.



Standard diameters on spools — full specs on **page 06**

QUICK ITEM REFERENCE

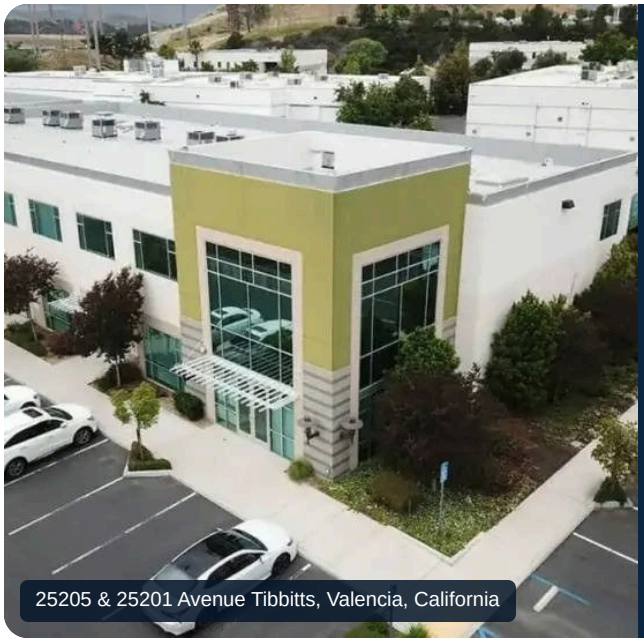
Item	Item No.	Wire Ø	Core Ø	Diamond	Application	
A	**9020125**	0.125 mm	0.10 mm	10 µm	Slice silicon, crystal	Quote ›
B	**9020145**	0.145 mm	0.12 mm	10 µm	Slice silicon, crystal	Quote ›
C	**9020025**	0.25 mm	0.18 mm	30–40 µm	Slice sapphire, CaF_2, glass, W alloy	Quote ›
D	**9020031**	0.31 mm	0.22 mm	30–40 µm	Crop silicon, sapphire, filament	Quote ›
E	**9020035**	0.35 mm	0.25 mm	40–50 µm	Square silicon	Quote ›
F	**9020037**	0.37 mm	0.27 mm	40–50 µm	Square silicon	Quote ›
G	**9020042**	0.42 mm	0.32 mm	40–50 µm	Square silicon	Quote ›

DIFFERENT PRODUCT • DIFFERENT TECHNOLOGY • DIFFERENT COMPANY

Expect MORE from your tools.

ABOUT UKAM

American manufacturer of diamond & CBN tools since 1990



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A U.S. LEADER IN SLICING, DICING & DRILLING

UKAM Industrial Superhard Tools is a U.S. high tech, specialty diamond tool & equipment manufacturer, and a leader in slicing, dicing, & drilling. As one of the few U.S. diamond tool manufacturers, we must remain innovative and continue to set the standard for technological advancement. Today we continue our research & development efforts to provide our clients the tools, equipment, & processes needed to remain competitive in today's global economy.

1990	75,000+	1000s	USA
Established	Clients worldwide	Stock products	American manufacturer

Since 1990, UKAM Industrial Superhard Tools has been a leader in bringing change to the industry, providing advanced diamond tools for a wide variety of industries and applications — "REAL SOLUTIONS" to your everyday cutting, drilling, grinding, and machining needs. Our products & solutions are used around the world by over 75,000 clients in industry, research & development, & many other applications. Only the highest quality synthetic diamonds and raw materials are used, and product consistency is maintained using sophisticated inspection and measurement equipment. We are a partner in your success.

DIFFERENT PRODUCT

Only the highest quality synthetic diamonds and raw materials, with product consistency maintained using sophisticated inspection and measurement equipment.

DIFFERENT TECHNOLOGY

Continuing research & development behind ***SMART CUT®*** technology — the tools, equipment & processes to stay competitive.

DIFFERENT COMPANY

A family-owned American manufacturer offering custom manufacturing, expert technical support and a partner in your success.

OTHER *SMART CUT®* PRODUCTS FOR ULTRA-HARD & BRITTLE MATERIALS

- DIAMOND CUT-OFF BLADES ›
- DIAMOND DICING BLADES ›
- DIAMOND BAND SAW BLADES ›
- PRECISION CUTTING SAWS ›
- DIAMOND DRILLS & CORE DRILLS ›
- DIAMOND & CBN GRINDING WHEELS ›
- LAPPING & POLISHING ›
- COOLANTS & LUBRICANTS ›

REQUEST A QUOTE › | TALK TO AN ENGINEER: 661-257-2288 | APPLICATION DATA SHEET P. 27 › | VIEW ONLINE ›

SMART CUT®

UKAM Industrial Superhard Tools

AMERICAN MANUFACTURER | ESTABLISHED 1990

LET'S SPECIFY YOUR DIAMOND WIRE

Standard spools • electroplated loops • custom wire for just about any wire saw machine





THREE STEPS TO THE RIGHT WIRE

1

SEND YOUR DATA

Fill in the Application Data Sheet or spool drawing in this brochure — or just send your saw model and material.

2

GET A RECOMMENDATION

A UKAM applications engineer recommends wire diameter, core, grit, bond and spool or loop length.

3

RECEIVE YOUR WIRE

Standard or made to your specification, shipped worldwide via UPS, FedEx and US Mail.

BEST PRICE

BEST PRICE GUARANTEE

Stock and custom products. See terms ›

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GUARANTEED TRIAL ORDER

Try *SMART CUT*® diamond wire. See terms ›

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SCAN FOR DIAMOND WIRE

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